

## ABSTRACT OF THE DISCLOSURE

The present invention provides a bias sputtering film forming process and film forming apparatus that can form a coating film having a good film thickness distribution in a minute coated surface of a complicated shape, such as contact holes, through-holes and wiring grooves, especially for the sidewall portions thereof.

To a bias sputtering film forming apparatus provided with a sputtering cathode 4 and a substrate stage 5 holding a target 6 and a substrate 7 facing to each other, respectively, in a vacuum chamber 1 having a sputtering gas inlet 3 and a vacuum exhaust port 2, a power source 9 of a variable output for the substrate stage 5 and a control system 10 are connected. The substrate bias voltage value when the cathode voltage is made set to a predetermined voltage previously, and the target is parted from the substrate by a predetermined distance; and the thickness distribution of the thin film on each surface corresponding to this substrate bias voltage value are stored in the control system 10 as reference data. The substrate bias voltage value to make the film thickness substantially uniform in the film forming of each surface is selected from the reference data to be a bias voltage function that makes this a variable, and the output of the power source is controlled by this function.